KEITHLEY

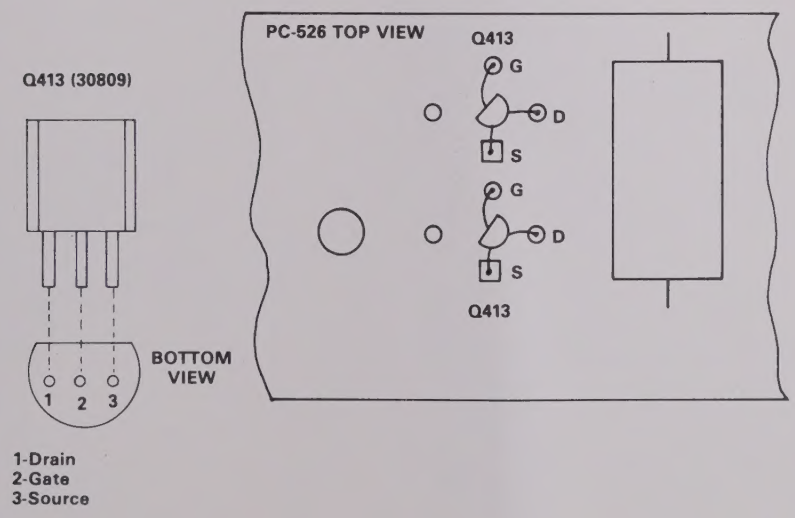
SERVICE MANUAL
ADDENDUM
MODEL 181

INTRODUCTION

The following change information is supplied as a supplement to this manual in order to provide the user with the latest improvements and corrections in the shortest possible time. It is recommended that this addendum be incorporated into the appropriate places in the manual immediately.

Q413 INSTALLATION

Use the following illustrations to install the matched J-FET pair (Keithley P/N 30809) in PC-526.



KEITHLEY

Addendum
30816-A-2
2/83

Instruction Manual Addendum
Model 181 Digital Multimeter

The following change information is supplied as a supplement to this manual in order to provide the user with the latest improvements and corrections in the least possible time. It is recommended that the information in this addendum be incorporated into the appropriate places in the manual immediately.

Changes to the instrument concern a resistor network and LEDs on the display board.

Schematic Number 30584D, PC-530: Change R201A through R201H from 82Ω to 150Ω.

Component Layout Number 30532D Change item 45 from TF-141 to TF-165-1. Change item 7 to DD-31. Change items 8-13 to DD-30.

Parts List: Change R201 part number from TF-141 to TF-165-1. Change DS201 to DD-31. Change DS202 through DS207 to DD-30.

KEITHLEY

Model 181 Addendum

INTRODUCTION

The following information is supplied as a supplement to this manual in order to provide the user with the latest improvements and corrections in the shortest possible time. It is recommended that this information be incorporated into the Service Manual immediately.

The following changes to the Model 181 Digital Nanovoltmeter have been made to eliminate possible radio frequency interference (RFI) related problems. These changes include the addition of aluminum shields to the instrument to limit RFI effects.

IEEE-488 interface cables with shielded connectors should be used with the Model 181. Two types are available from Keithley: Model 7007-1 (1m/3.3 ft.) and Model 7007-2 (2m/6.6 ft.).

In addition, the nanovoltmeter preamp board has been modified to maintain input resistance of $>10^9\Omega$ with up to 2.2V on mV ranges.

Table 1. Parts List Additions

Circuit Desig.	Description	Schematic Dwg. No. and Location	PC Board Item No./Location	Keithley Part No.
—	Front Panel Shield	—	—	181-303
—	Top Cover Shield	—	—	617-322
—	Ground Clip	—	—	181-304
—	RFI Label ("RFI Shielding Installed")	—	—	MC-410
L301	Choke (Rear Panel Assembly)	30585/A1	PC-529	CH-29
FL101	Line Filter	30583/A4	—	LF-2
L102	Choke	30583/D5	PC-531:224/G6	CH-29
J1011	Pin	30585/A1	PC-529:129/B1	CS-357
J1012	Pin	30585/A2	PC-529:130/A1	CS-463
—	Connector	30586	PC-526:34/C3	CS-339-3
VR405	Zener Diode	30586/A1	PC-526:120/D3	DZ-67
VR406	Zener Diode	30586/A2	PC-526:121/D3	DZ-67
U404	Integrated Circuit	30586/D1	PC-526:110/C3	30154
U406	Integrated Circuit	30586/D5	PC-526:112/C3	30167

Table 2. Parts List Deletions

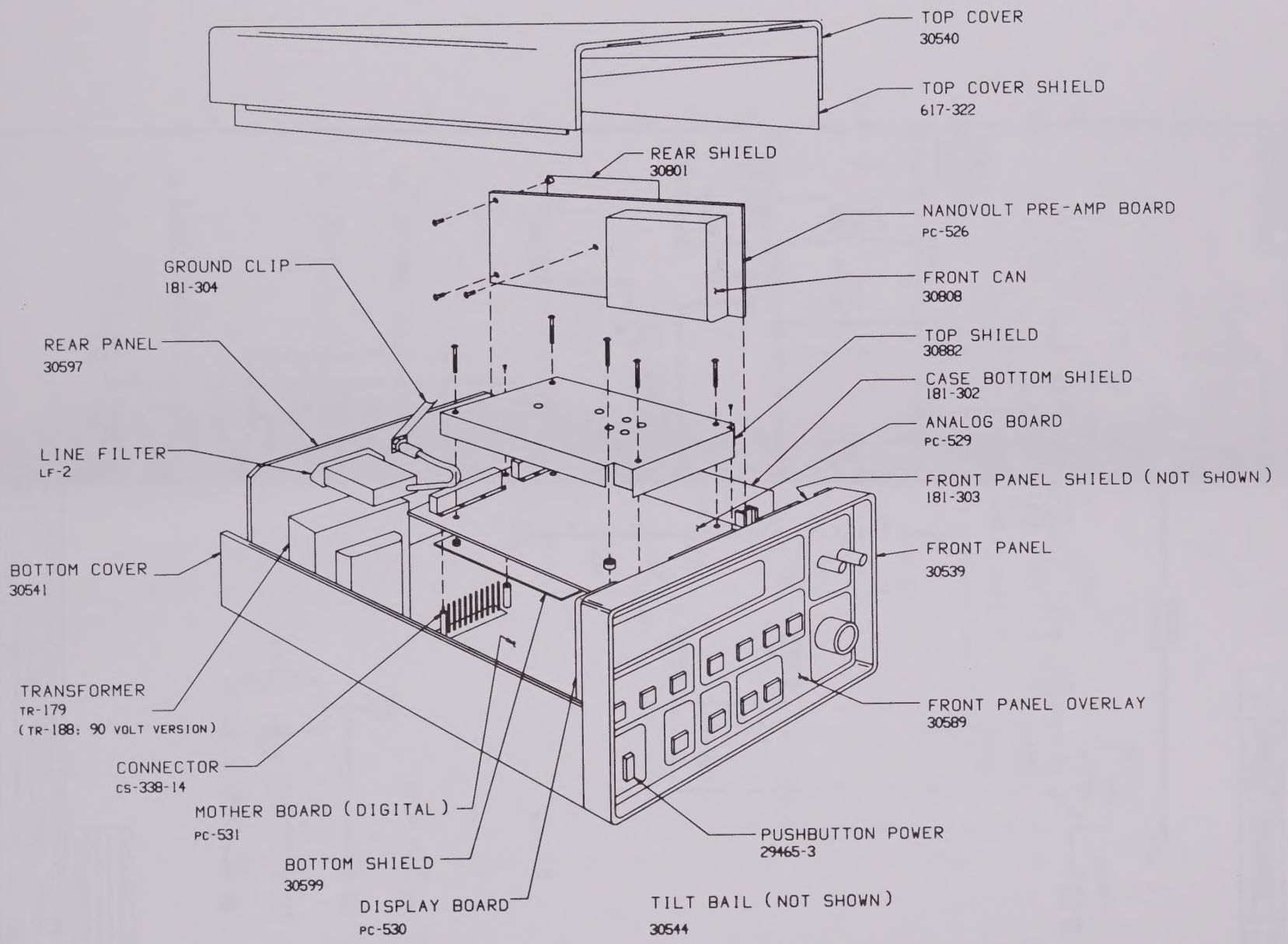
Circuit Desig.	Description	Schematic Dwg. No. and Location	PC Board Item No./Location	Keithley Part No.
J1011	Connector	—	—	CS-254
CR404	Diode	30586/B1	PC-526:25/D3	RF-41
CR405	Diode	30586/B2	PC-526:26/D3	RF-41
Q410	N-Channel FET	30586/B2	PC-526:47/C3	TG-128
Q411	N-Channel FET	30586/B1	PC-526:48/C3	TG-128
U404	Dual Op Amp	30586/D2	PC-526:110/C3	30477
MK-8	Mounting Kit	30586	—	MK-8
HS-8	Heat Sink	30586	—	HS-8

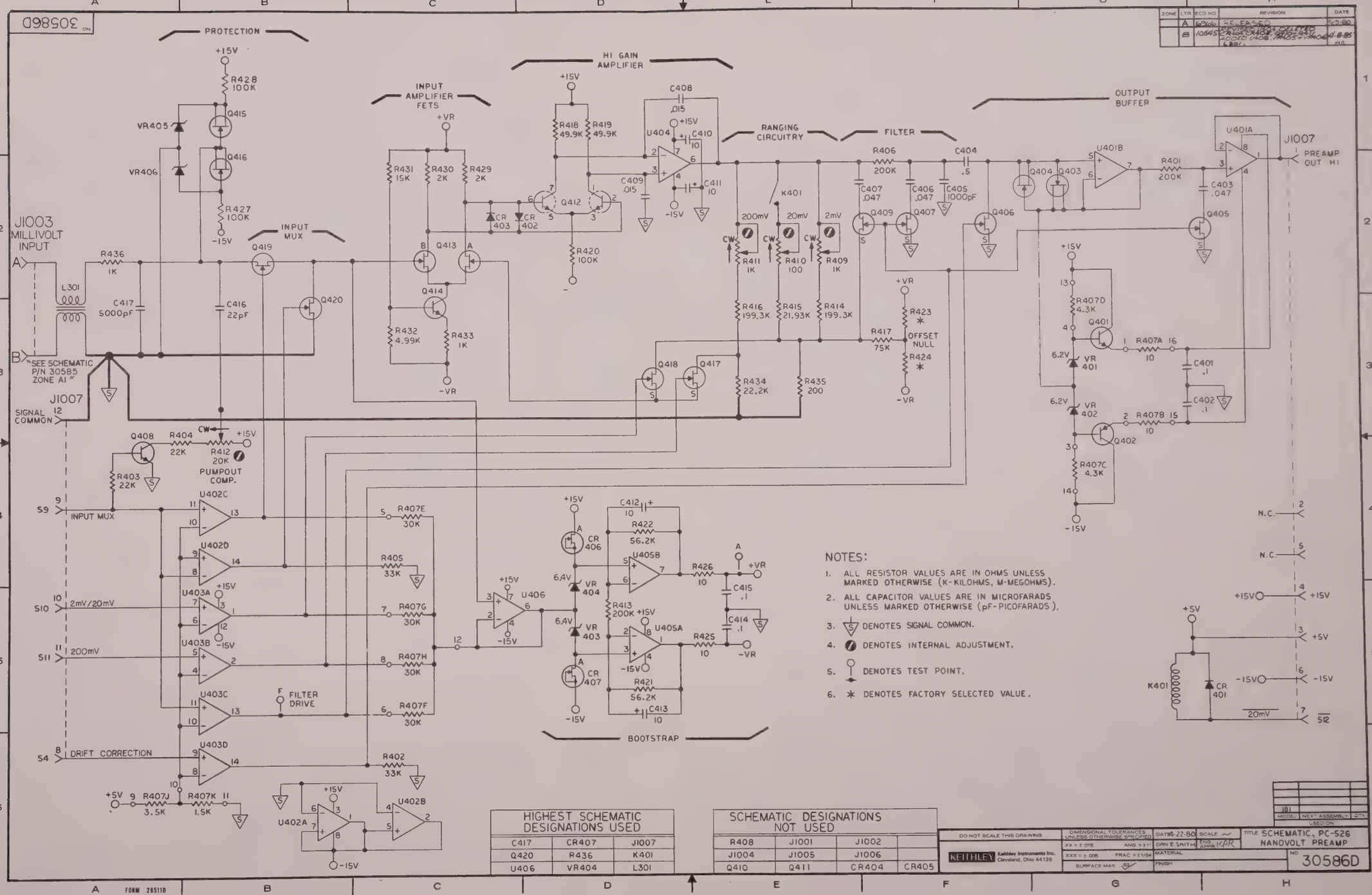
Drawing Level Revisions

The following drawings in the Service Manual have been revised. Copies of the updated drawings are attached.

Drawing	New Revision Level
30586	B
30585	D
30583	H
30377	D
30503	N
30576	R

Also attached is Figure 5-23, an exploded view of the Model 181. This drawing should go at the end of the Maintenance Section.


TOP COVER
30540
TOP COVER SHIELD
617-322
REAR SHIELD
30801
NANOVOLT PRE-AMP BOARD
PC-526
GROUND CLIP
181-304
FRONT CAN
30808
REAR PANEL
30597
TOP SHIELD
30882
CASE BOTTOM SHIELD
181-302
ANALOG BOARD
PC-529
LINE FILTER
LF-2
FRONT PANEL SHIELD (NOT SHOWN)
181-303
FRONT PANEL
30539
BOTTOM COVER
30541
TRANSFORMER
TR-179
(TR-188: 90 VOLT VERSION)
FRONT PANEL OVERLAY
30589
CONNECTOR
CS-338-14
MOTHER BOARD (DIGITAL)
PC-531
PUSHBUTTON POWER
29465-3
BOTTOM SHIELD
30599
DISPLAY BOARD
PC-530
TILT BAIL (NOT SHOWN)
30544



HIGHEST SCHEMATIC DESIGNATIONS USED		
C417	CR407	J1007
Q420	R436	K401
U406	VR404	L301

SCHEMATIC DESIGNATIONS NOT USED			
R408	J1001	J1002	
J1004	J1005	J1006	
Q410	Q411	CR404	CR405

ZONE	LTR	ECO NO	REVISION	DATE
	A	10496	RELEASED	6-3-80
	B	10545	CR406, CR407 ADDED. R408, R409 ADDED. U406, 7MOS-YMOD.	4-8-85

KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139

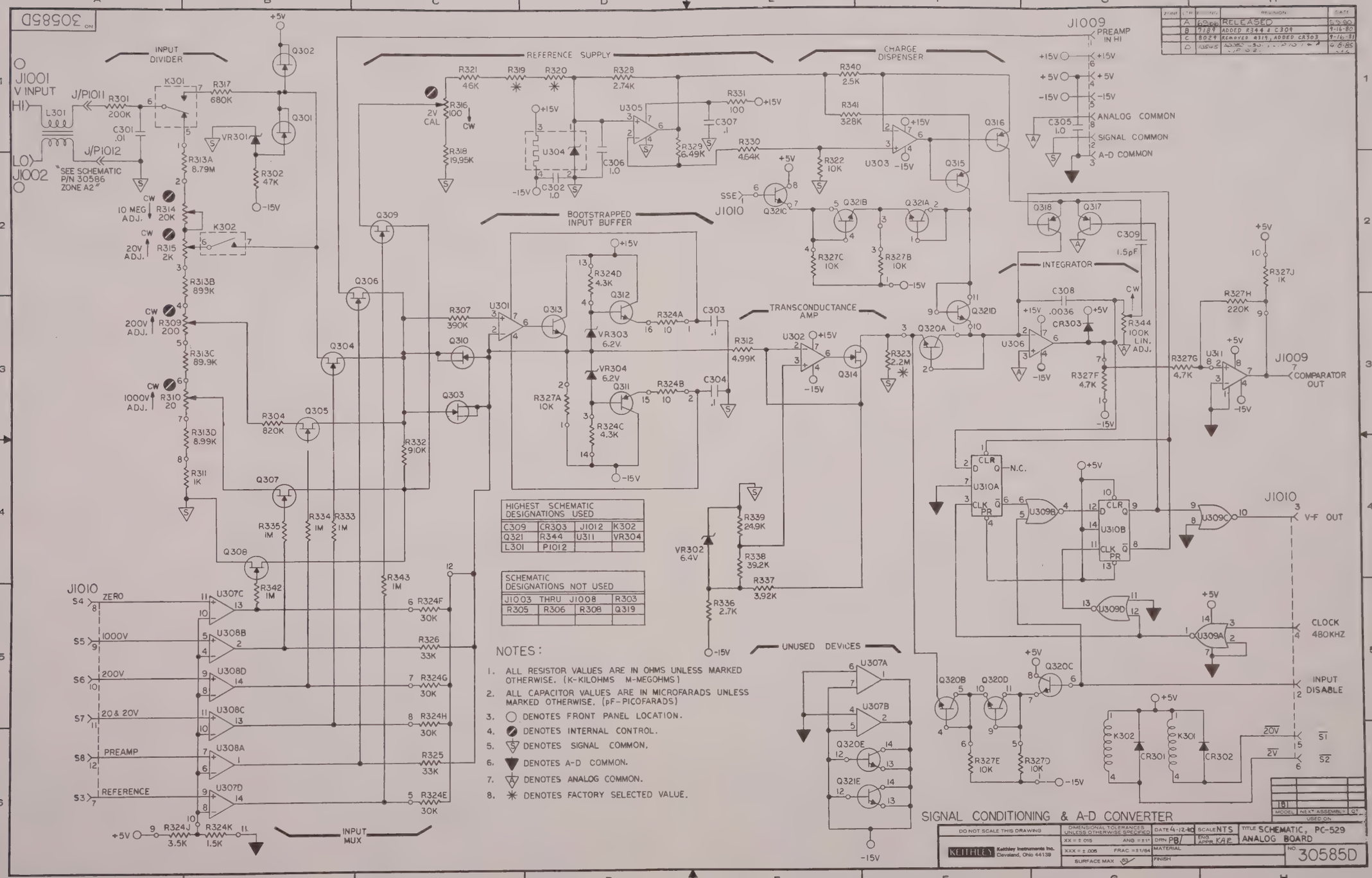
DO NOT SCALE THIS DRAWING | DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED: XX = ± .015, ANG = ±1°, XXX = ± .005, FRAC = ±1/64, SURFACE MAX 63 | DATE 4-22-80 | SCALE ~ | DRN R SMITH | ENG APPR ICAR | MATERIAL | FINISH

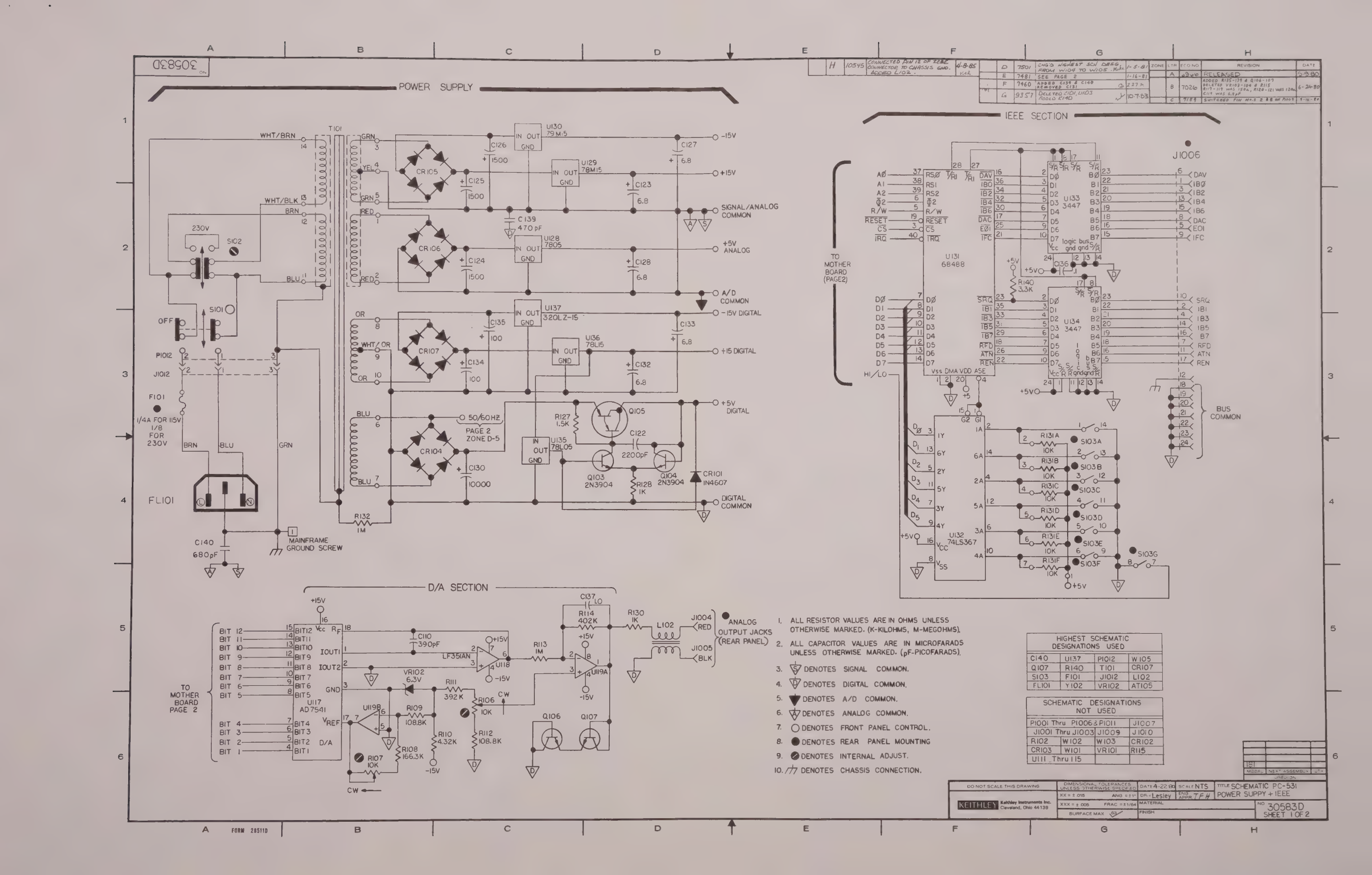
TITLE SCHEMATIC, PC-526 NANOVOLT PREAMP

NO 30586D

181 MODEL | NEXT ASSEMBLY | USED ON

FORM 28511D


INPUT DIVIDER
REFERENCE SUPPLY
CHARGE DISPENSER
BOOTSTRAPPED INPUT BUFFER
TRANSCONDUCTANCE AMP
INTEGRATOR
INPUT MUX
UNUSED DEVICES
J1001 V INPUT HI
J1002 LO
J/P1011
J/P1012
"SEE SCHEMATIC P/N 30586 ZONE A2"
J1009 PREAMP IN HI
+15V
+5V
-15V
ANALOG COMMON
SIGNAL COMMON
A-D COMMON
J1010
S4 ZERO
S5 1000V
S6 200V
S7 20 & 20V
S8 PREAMP
S3 REFERENCE
+5V
R324J 3.5K
R324K 1.5K
2V CAL
10 MEG ADJ.
20V ADJ.
200V ADJ.
1000V ADJ.
N.C.
COMPARATOR OUT
V-F OUT
CLOCK 480KHZ
INPUT DISABLE
20V
2V
S1
S2
HIGHEST SCHEMATIC DESIGNATIONS USED
C309 CR303 J1012 K302
Q321 R344 U311 VR304
L301 P1012
SCHEMATIC DESIGNATIONS NOT USED
J1003 THRU J1008 R303
R305 R306 R308 Q319
NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS UNLESS MARKED OTHERWISE. (K-KILOHMS M-MEGOHMS)
2. ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS MARKED OTHERWISE. (pF-PICOFARADS)
3. ○ DENOTES FRONT PANEL LOCATION.
4. ⊘ DENOTES INTERNAL CONTROL.
5. ▽ DENOTES SIGNAL COMMON.
6. ▼ DENOTES A-D COMMON.
7. ▽ DENOTES ANALOG COMMON.
8. ✳ DENOTES FACTORY SELECTED VALUE.
SIGNAL CONDITIONING & A-D CONVERTER
KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139
SCALE NTS
TITLE SCHEMATIC, PC-529 ANALOG BOARD
NO. 30585D
DRN PB
ENG APPR KAP
DATE 4-12-80
DO NOT SCALE THIS DRAWING
FORM 28511D



ZONE	LTR	ECO NO.	REVISION	DATE
	A	69x90	RELEASED	2-9-80
	B	70226	ADDED R135-139 & Q106-109 DELETED VR103-104 & R115 R119-119 WAS 150A, R120-121 WAS 124A C117 WAS 6.8pF	6-26-80
	C	9189	SWITCHED PIN NOS 2 & 8 on P1003	9-16-80

	D	7501	CHGD HIGHEST SCH DESIG FROM W104 TO W105	1-5-81
	E	7481	SEE PAGE 2	1-16-81
	F	7460	ADDED C139 & C140 REMOVED C131	2.2.7%
	G	9357	DELETED C101, U103 ADDED R140	10-7-83
	H	10545	CONNECTED PIN 12 OF IEEE CONNECTOR TO CHASSIS GND. ADDED L102.	4-8-85 KAR

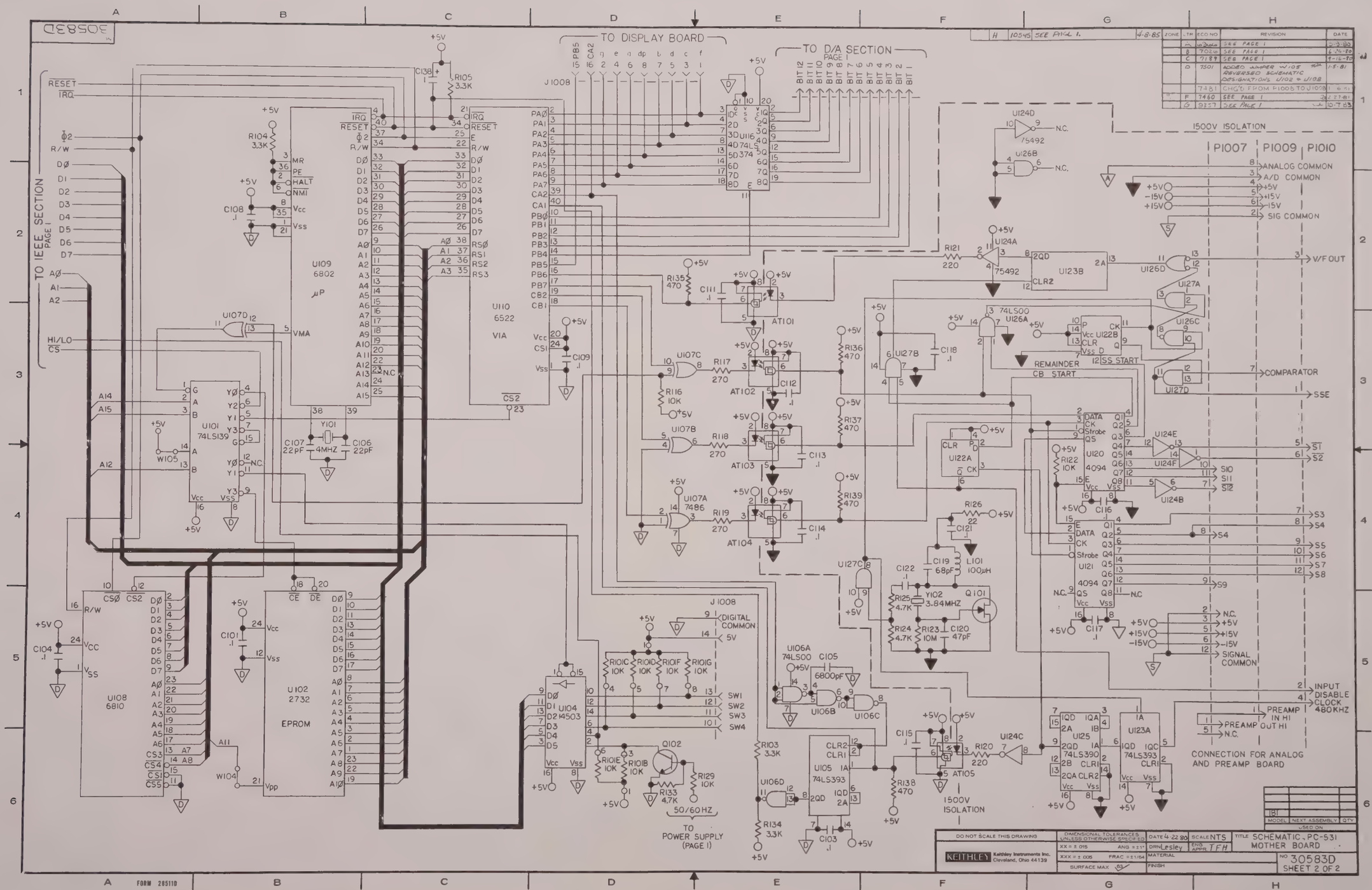
1. ALL RESISTOR VALUES ARE IN OHMS UNLESS OTHERWISE MARKED. (K-KILOHMS, M-MEGOHMS).
2. ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE MARKED. (pF-PICOFARADS).
3. DENOTES SIGNAL COMMON.
4. DENOTES DIGITAL COMMON.
5. DENOTES A/D COMMON.
6. DENOTES ANALOG COMMON.
7. DENOTES FRONT PANEL CONTROL.
8. DENOTES REAR PANEL MOUNTING
9. DENOTES INTERNAL ADJUST.
10. DENOTES CHASSIS CONNECTION.

HIGHEST SCHEMATIC DESIGNATIONS USED			
C140	U137	P1012	W105
Q107	R140	T101	CR107
S103	F101	J1012	L102
FL101	Y102	VR102	AT105

SCHEMATIC DESIGNATIONS NOT USED			
P1001 Thru P1006 & P1011			J1007
J1001 Thru J1003		J1009	J1010
R102	W102	W103	CR102
CR103	W101	VR101	R115
U111 Thru 115			

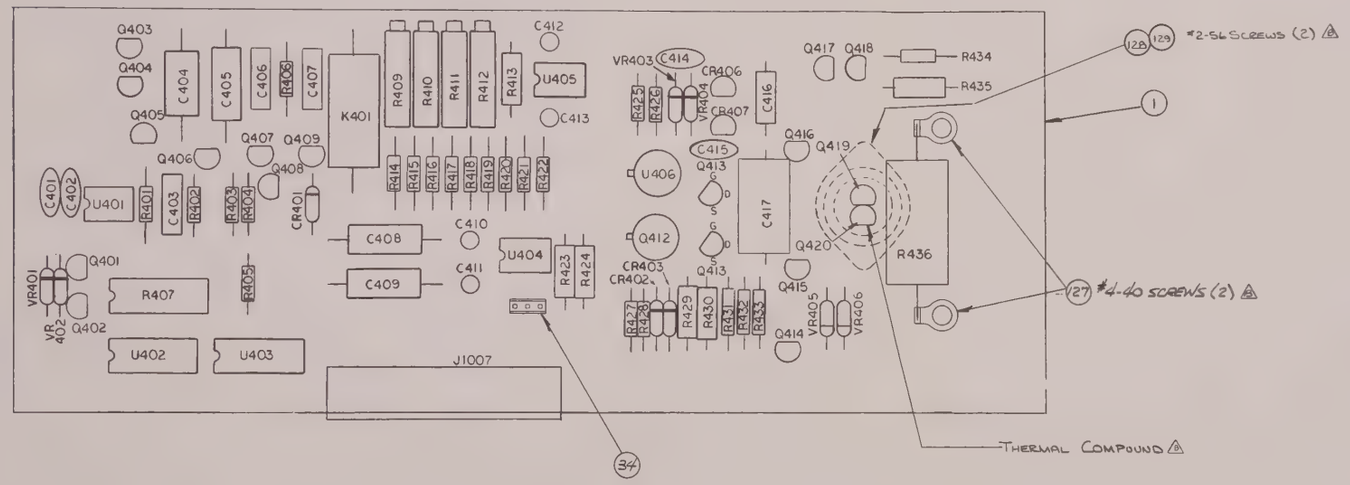
DO NOT SCALE THIS DRAWING	DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED	DATE 4-22-80	SCALE NTS	TITLE SCHEMATIC PC-531 POWER SUPPY + IEEE
KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139	XX = ± .015 ANG = ± 1° XXX = ± .005 FRAC = ± 1/64 SURFACE MAX 63	DR. Lesley ENG APPR. TFH	MATERIAL FINISH	NO. 30583D SHEET 1 OF 2

FORM 28511D


30583D
TO DISPLAY BOARD
TO D/A SECTION
TO IEEE SECTION
1500V ISOLATION
P1007
P1009
P1010
ANALOG COMMON
A/D COMMON
+5V
-15V
+15V
SIG COMMON
W/F OUT
COMPARATOR
SSE
SIO
SI1
SI2
S1
S2
S3
S4
S5
S6
S7
S8
S9
SIGNAL COMMON
INPUT DISABLE CLOCK 480KHZ
PREAMP IN HI
PREAMP OUT HI
N.C.
CONNECTION FOR ANALOG AND PREAMP BOARD
REMAINDER CB START
SS START
U109 6802 µP
U110 6522 VIA
U101 74LS139
U102 2732 EPROM
U104 14503
U105 74LS393
U106 74LS00
U107 7486
U108 6810
U111 74LS374
U122 U123 U124 U125 U126 U127 74LS00
U120 4094
U121 4094
Y101 4MHZ
Y102 3.84MHZ
Q101
Q102
L101 100µH
AT101
AT102
AT103
AT104
AT105
J1008
DIGITAL COMMON
50/60HZ
TO POWER SUPPLY (PAGE 1)
1500V ISOLATION
KEITHLEY
Keithley Instruments Inc. Cleveland, Ohio 44139
DO NOT SCALE THIS DRAWING
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED
DATE 4-22-80
SCALE NTS
TITLE SCHEMATIC, PC-531 MOTHER BOARD
DRN Lesley
ENG APPR TFH
MATERIAL
FINISH
NO 30583D
SHEET 2 OF 2
FORM 285110

30377D

ZONE	LTR	ECO NO	REVISION	DATE
	A	7654	RELEASED	1-28-80
	B	8887	ITEM 1 WAS 378-2 ITEMS 2-4 WERE 3-378 ITEM 5 WAS 3-378 ITEMS 6-8 WERE 3-378 KNOBS ADDED C READ TO ITEM 27 ADDED 1 FOOT OF WIRE TO ITEMS 128 & 129 ADDED NOTE 6 THERMAL COMPOUND ADDED "A" TO WIRING TO ITEM 127	4-11-80
M	C	7501	ADDED ITEMS #180; MK-8 AND #181, MS-8	4-8-81
	D	10545	CHG'D PC ARTWORK NOS REF'S CHG'D U409, U415 30477A ADDED U405, VR403 VR404 + VR405 DELETED CR404 + CR405 C410, C411 DELETED MK-8 + MS-8 ITEMS 180 + 181 ADDED 3-337-3, 1784-346.	4-8-85



ITEM	PART NO.	SCHEM. DESIG.	ZONE
1	30378C	STAKING	E2
2			
3	C-238-.1	C401	A3
4	"	C402	A3
5	C-306-.047	C403	B3
6	C-201-.5	C404	B2
B 7	C-138 1000pF	C405	B2
8	C-306-.047	C406	B2
9	"	C407	B2
A 10	C-221-.015	C408	B3
A 11	"	C409	B3
12	C-179-10	C410	C3
13	"	C411	C3
14	"	C412	C2
15	"	C413	C2
16	C-238-.1	C414	D2
17	"	C415	D2
18	C-138-22pF	C416	D3
19	C-12K-5000pF	C417	D3
20			
21			
22			
22			
23	RF-28	CR401	B3
23		CR402	C3
24	'	CR403	C3
A A 25			

ITEM	PART NO.	SCHEM. DESIG.	ZONE
A 26			
27	TG-140	CR406	D2
28	"	CR407	D2
29			
30			
31			
32			
33	CS-337-12	J1007	C3
34	CS-339-3	—	C3 A
35			
36			
37			
38	TG-47	Q401	A3
39	TG-84	Q402	A3
40	TG-139	Q403	A2
41	"	Q404	A2
A 42	TG-128	Q405	A2
43	TG-128	Q406	B2
A 44	TG-128	Q407	B2
45	TG-47	Q408	B2
46	TG-139	Q409	B2
A 47			
A 48			
49	TG-142	Q412	C3
50	30809	Q413	D3
51	TG-143	Q414	D3
52	TG-128	Q415	D3

ITEM	PART NO.	SCHEM. DESIG	ZONE
53	TG-128	Q416	D2
54	"	Q417	D2
55	"	Q418	D2
56	"	Q419	D3
57	"	Q420	D3
58			
59			
60			
61			
62			
63	R-88-200K	R401	A3
64	R-76-33K	R402	B2
65	R-76-22K	R403	B2
66	"	R404	B3
67	R-76-33K	R405	B3
68	R-88-200K	R406	B2
69	TF-87	R407	A3
70	NOT USED		
71	RP-89-1K	R409	B2
72	RP-89-100	R410	B2
73	RP-89-1K	R411	C2
74	RP-89-20K	R412	C2
75	R-88-200K	R413	C2
76	R 263-139.3K	R414	B3
77	R 263-21.93K	R415	B3
78	R 263-139.3K	R416	B3
79	R-88-75K	R417	C2

ITEM	PART NO	SCHEM DESIG	ZONE
80	R-176-49.9K	R418	C3
81	"	R419	C3
82	R-88-100K	R420	C2
83	R-88-56.2K	R421	C2
84	"	R422	C2
85	R 88-*	R423	C3
86	"	R424	C3
87	R-76-10	R425	C2
88	"	R426	C2
89	R 76-100K	R427	C3
90	"	R428	C3
91	R-291-2K	R429	D3
92	"	R430	D3
93	R-88-15K	R431	D3
94	R-88-4.99K	R432	D3
95	R-88-1K	R433	D3
96	R-263-23.2K	R434	D2
97	R-291-200	R435	D2
98	R-290-1K	R436	D3
99			
100			
101			
A 102	RL-59	K401	B2
103			
104			
105			
106			

ITEM	PART NO.	SCHEM. DESIG.	ZONE
107	30475A	U401	A3
108	IC-219	U402	A3
109	"	U403	B3
A 110	30154	U404	C3
111	30477A	U405	C3
A 112	30167A	U406	C3
113			
114			
115			
116	DZ-48	VR401	A3
117	"	VR402	A3
118	DZ-60	VR403	C2
119	"	VR404	C2
A 120	DZ-67	VR405	D3
A 121	DZ-67	VR406	D3
A 127	LU-39	2 Req'd	E3
128	30582B	—	E2
129	GA-20	—	E2

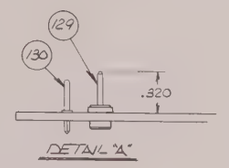
ITEM	PART NO.	SCHEM DESIG	ZONE
A A 180			
A A 181			

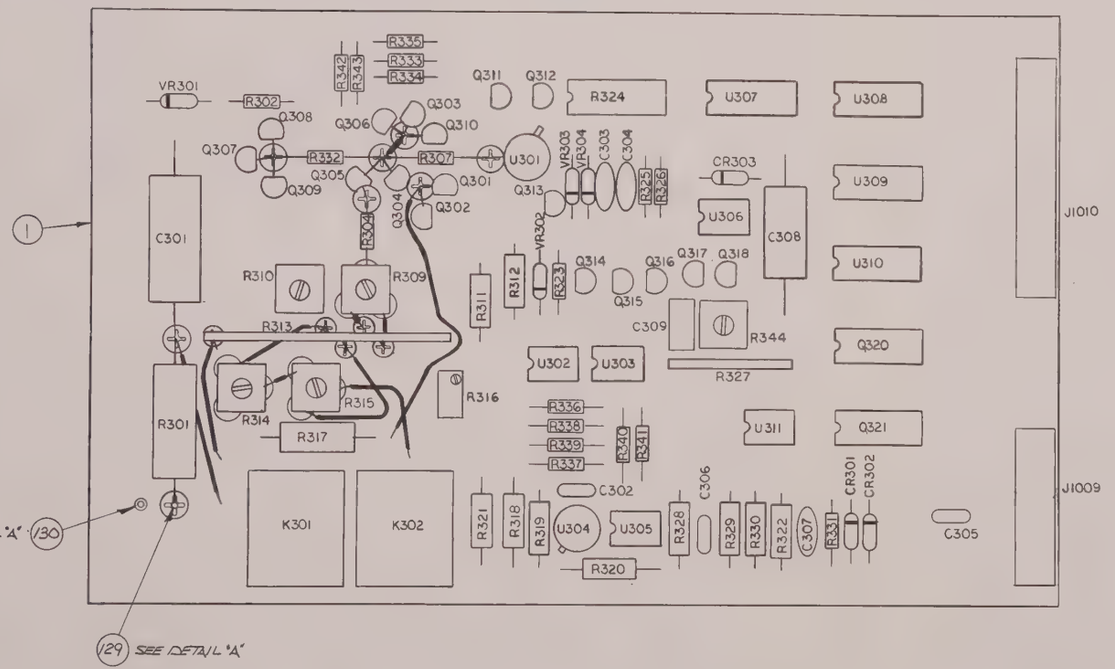
DO NOT SCALE THIS DRAWING	DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED	DATE 1/14/80	SCALE 2-1
KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139	XX ± .015 ANG ± °	DRN [illegible]	ENG APPR KAR
	XXX ± .005 FRAC ± 1/64	MATERIAL	
	SURFACE MAX	FINISH	

TITLE COMPONENT LAYOUT, PC-526 (PRE-AMP BOARD)

NO 30377D

FORM 285110





ZONE	LTR	EC NO.	REVISION	DATE
	A	0754	RELEASED	1-24-80
	B	0830	ASY WAS REV B ITEM "34 WAS "39, ITEMS "42 & 43 WERE "5.6K & DELETED ITEMS "56 & 58 WAS "5. ITEM "10 WAS K88 C.O.K. ITEM "13 WAS TF-84 ITEM "14 WAS 1% R.O. ITEM "81 WAS 1.0K C. ITEM "82 WAS 3.9K 1% C.O. TO ITEMS "4 & 6 ACHANGE ITEMS 10, 115, 128-80	3-14-80
	C	0887	C308 WAS 3.300 R318 WAS 82.1 WERE E-293 K301 & 302 WERE RL301 & 302	4-11-80
	D	0905	ITEM 128 WAS SC-12-0 ITEM 129 WAS SC-12-2	4-14-80
	E	6513	ITEM 81 WAS R-88-6.49K	4-18-80
	F	6928	CHG'D ITEM 34 FROM TG-128 TO TG-139 & ADDED ITEMS 126 & 127 & DET.	6-19-80
	G	7026	R341 WAS 312K. ITEM 130 WAS LU-88	6-24-80
	H	7189	RELOCATED R342 & R343 ADDED R344 & C309	9-16-80
	J	7556	CHG'D REV ON BOARD FROM D TO E	2-6-81
	K	8029	ARTWORK WAS REV. E, REMOVED R319, ADDED CR303	9-16-81
	L	8274	CHG'D ARTWORK TO REV. G	3-5-82
	M	8315	ITEM "128 WAS SC-66-0; ITEM "129 WAS SC-66-2; ITEM "130 WAS LU-46	5-23-83
	N	10545	DELETED SC-66-0, ITEM 128 ITEM 129 WAS SC-66-2 ITEM 130 WAS LU-99-1 " 129 ADDED CS-357 " 130 " CS-463.	4-8-85

ITEM	PART NO.	SCHEM. DESIG.	ZONE
101	IC-173	U311	D4
.02			
.03			
104			
105	DZ-69	VR301	B2
106	DZ-60	VR302	C3
107	DZ-48	VR303	C3
108	"	VR304	C3
109			
110			
111			
112			
113			
114			
115			
116	R-76-910K	R332	B2
117	R-76-1M	R333	B2
118	"	R334	B2
119	"	R335	B2
120	R-76-27K	R336	C4
121	R-88-3.92K	R337	C4
122	R-88-39.2K	R338	C4
123	R-88-24.9K	R339	C4
124	R-176-2.5K	R340	C4
125	R-176-328K	R341	C4
126	R-76-1M	R342	B2
127	"	R343	B2
128			
129	CS-357	J101/	B1
130	CS-463	J102	A1

ITEM	PART NO.	SCHEM. DESIG.	ZONE
1	30504C	STAKING	A3
2			
3			
4	C-286-.01	C301	B3
5	C-237-1.0	C302	C4
6	C-238-.1	C303	C2
7	"	C304	C2
8	C-237-1.0	C305	E4
9	"	C306	D4
10	C-238-.1	C307	D4
11	C-138-3600pF	C308	D3
12	C-282-1.5pF	C309	C3
13			
14			
15			
16	RF-28	CR301	D4
17	"	CR302	D4
18	"	CR303	D2
19			
20			

ITEM	PART NO.	SCHEM. DESIG.	ZONE
21	CS-332-12	J1010	E2
22	CS-332-8	J1009	E4
23			
24			
25			
26	TG-139	Q301	C2
27	"	Q302	C3
28	"	Q303	B2
29	"	Q304	B2
30	"	Q305	B2
31	"	Q306	B2
32	"	Q307	B2
33	"	Q308	B2
34	TG-139	Q309	B3
35	TG-139	Q310	C2
36	TG-84	Q311	C2
37	TG-47	Q312	C2
38	"	Q313	C3
39	TG-128	Q314	C3
40	TG-84	Q315	C3

ITEM	PART NO.	SCHEM. DESIG.	ZONE
41	TG-84	Q316	C3
42	TG-84	Q317	D3
43	"	Q318	D3
44			
45	29198	Q320	D3
46	"	Q321	D4
47			
48			
49			
50			
51			
52			
53	R-247-200K	R301	B3
54	R-76-47K	R302	B2
55	NOT USED		
56	R-76-820K	R304	B3
57	NOT USED		
58	NOT USED		
59	R-76-390K	R307	C2
60	NOT USED		

ITEM	PART NO.	SCHEM. DESIG.	ZONE
61	RP-97-200	R309	B3
62	RP-97-20	R310	B3
63	R-263-1K	R311	C3
64	R-263-4.99K	R312	C3
65	TF-83	R313	B3
66	RP-97-20K	R314	B4
67	RP-97-2K	R315	B4
68	RP-104-100	R316	C4
69	R-2-680K	R317	B4
70	R-295-19.95K	R318	C4
71	R-263-* OR 2.3 (PART OF 29198)	R319	C4
72	R-84-* OR 2.3 (PART OF 29198)	R320	C4
73	R-295-46K	R321	C4
74	R-88-10K	R322	D4
75	R-76-2.2M	R323	C3
76	TF-87	R324	C2
77	R-76-33K	R325	C2
78	"	R326	C2
79	TF-85	R327	D3
80	R-88-2.74K	R328	C4

ITEM	PART NO.	SCHEM. DESIG.	ZONE
81	R-88-6.49K	R329	D4
82	R-88-5.4K	R330	D4
83	R-76-100	R331	D4
84	RP-97-100K	R344	D3
85			
86			
87	RL-68	K301	B4
88	"	K302	B4
89			
90			
91	30167A	U301	C3
92	30163A	U302	C3
93	30154A	U303	C3
94	29996B	U304	C4
95	30154A	U305	C4
96	IC-176	U306	D3
97	IC 219	U307	D2
98	"	U308	D2
99	IC-179	U309	D2
100	IC-216	U310	D3

181			
MODEL	NEXT ASSEMBLY	QTY	

DO NOT SCALE THIS DRAWING

KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED: XX ± .015 ANG. ± 1° XXX ± .005 FRAC ± 1/64 SURFACE MAX 63

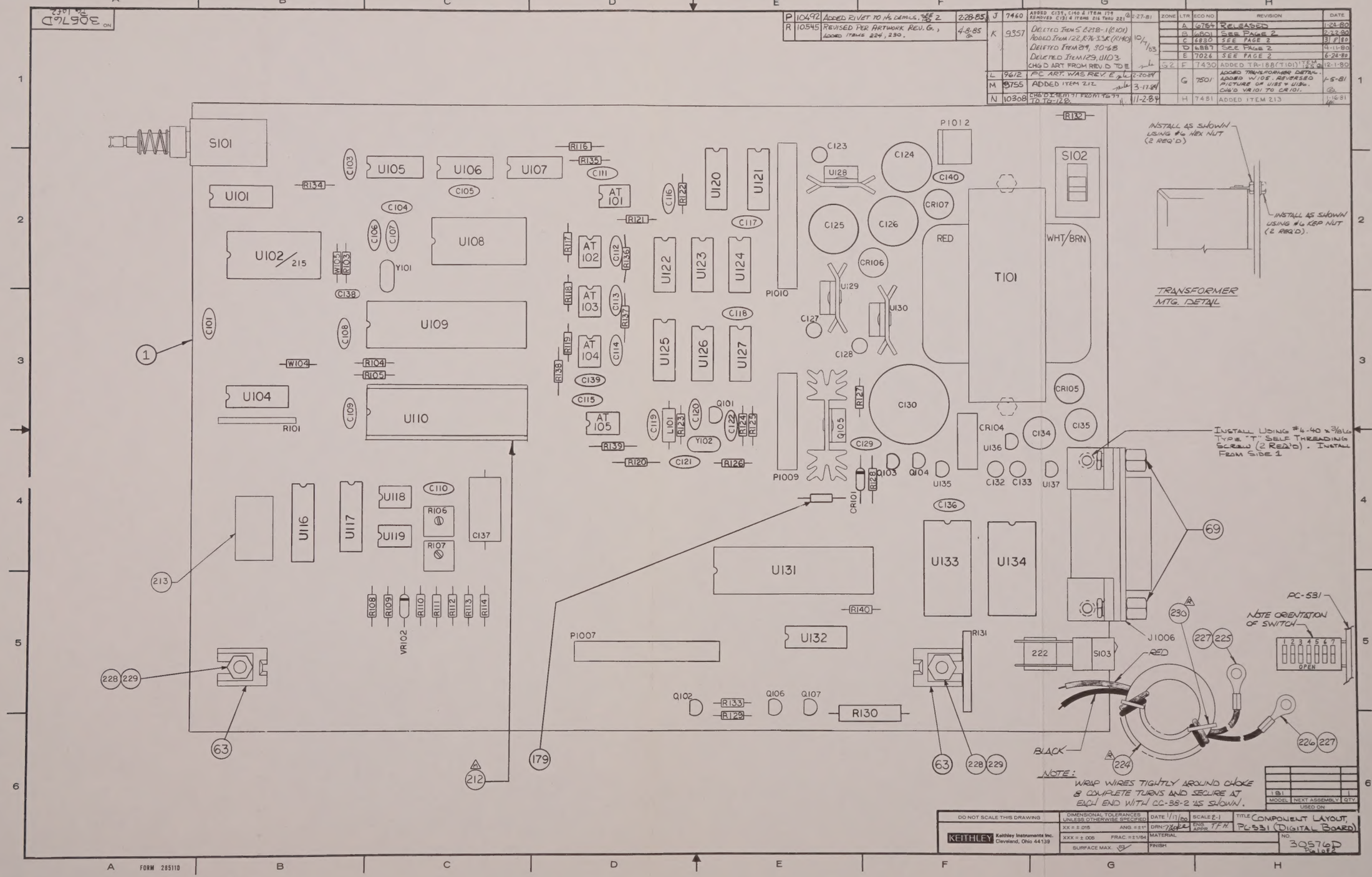
DATE 7-30-81 SCALE 2/1 DRN Nicole ENG APPR KAR MATERIAL FINISH

TITLE COMPONENT LAYOUT PC-529 (ANALOG BOARD)

NO 30503D

SHT 2 OF 2

FORM 285110



ZONE	LTR	ECO NO	REVISION	DATE
	A	6754	RELEASED	1-24-80
	B	6801	SEE PAGE 2	2-22-80
	C	6830	SEE PAGE 2	3|F|80
	D	6887	SEE PAGE 2	4-11-80
	E	7026	SEE PAGE 2	6-26-80
G2	F	7430	ADDED TR-18A(T101) ITEM 125	12-1-80
	G	7501	ADDED TRANSFORMER DETAIL. ADDED W105; REVERSED PICTURE OF U135 & U136. CHG'D VR101 TO CR101.	1-5-81
	H	7481	ADDED ITEM 213	1-16-81

P	10492	ADDED RIVET TO H/S DETAILS, SEE 2.	2-28-85	
R	10545	REVISED PER ARTWORK REV. G, ADDED ITEMS 224, 230.	4-8-85	
J	7460	ADDED C131, C140 & ITEM 179 REMOVED C131 & ITEMS 216 THRU 221	2-27-81	
K	9357	DELETED ITEMS 6238-1(CR101) ADDED ITEM 122, R.N-33K (RP40) DELETED ITEM 89, 90-68 DELETED ITEM 129, U113 CHG'D ART FROM REV. D TO E	10/4/83	
L	9612	PC ART WAS REV. E	2-2084	
M	9755	ADDED ITEM 212	3-17-84	
N	10308	CHG'D ITEM 71 FROM 9679 TO TG-128	11-2-84	

DO NOT SCALE THIS DRAWING	DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED: XX = ± .015 ANG. = ±1° XXX = ± .005 FRAC. = ±1/64 SURFACE MAX.	DATE 1/11/00 DRN TFH ENG APPR TFH MATERIAL FINISH
KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139	SCALE 2:1	TITLE COMPONENT LAYOUT, PC-531 (DIGITAL BOARD) NO. 30576D Rev. E

1B1		1
MODEL	NEXT ASSEMBLY	QTY.
USED ON		

FORM 28511D

30576D Pg 2 of 3

ITEM	PART NO.	SCHEM. DESIG.	ZONE
1	30578	STAKING	A3
2			
3			
4	C-238-.1	C101	A3
5			
6	"	C103	B2
7	"	C104	C2
8	C-22-.0068	C105	C2
9	C-64-22pF	C106	C2
10	"	C107	C2
11	C-238-.1	C108	B2
12	"	C109	B2
13	C-22-330pF	C110	C4
14	C-238-.1	C111	D2
15	"	C112	D2
16	"	C113	D3
17	"	C114	D3
18	"	C115	D3
19	"	C116	D2
20	"	C117	E2
21	"	C118	E3
22	C-64-68pF	C119	D3
23	C-64-47pF	C120	D3
24	C-238-.1	C121	D4
25	"	C122	E3
26	C-314-6.8	C123	E2
27	C-314-1500	C124	F2
28	C-314-1500	C125	E2
29	"	C126	F2
30	C-314-6.8	C127	E3
31	"	C128	F3
32	C-22-2200pF	C129	F4
33	C-304-10000	C130	F3
34			
35	C-314-6.8	C132	F4
36	"	C133	F4
37	C-295-100	C134	F4
38	"	C135	G4
40	C-238-.1	C136	F4
41	C-215-1	C137	C4
42	C-204-1	C138	B2
43			
44			
45	C-324-470pF	C139	D3
46	C-324-680pF	C140	F2
47			
48			
49			
50			
51			
52			
53	RF-48	CR104	F4
54	RF-46	CR105	E3
55	"	CR106	F2
56	"	CR107	F2
57			
58			
59			
60	CH-14	L101	D3
61			

ITEM	PART NO.	SCHEM. DESIG.	ZONE
62			
63	CS-418	——	B5/F5
64	CS-338-12	P1007	D5
65	CS-338-14	P1010	E2
66	CS-338-13	P1009	E3
67	CS-288-3	P1012	F2
68	CS-377	J1006	G4
69	CS-378	——	G4
70			
71	TG-128	Q101	E3
72	TG-47	Q102	D5
73	"	Q103	F4
74	"	Q104	F4
75	32469-1	Q105	E3
76	TG-39	Q106	E5
77	"	Q107	E5
78			
79			
80	TF-99	R101	B3
81	NOT USED		
82	R-76-3.3K	R103	B2
83	"	R104	C3
84	"	R105	C3
85	RP-97-10K	R106	C4
86	"	R107	C4
87	R-176-166.3K	R108	C5
88	R-176-108.8K	R109	C5
89	R-88-4.32K	R110	C5
90	R-88-392K	R111	C5
91	R-176-108.8K	R112	C5
92	R-176-1M	R113	C5
93	R-88-402K	R114	C5
94			
95	R-76-10K	R116	D2
96	R-76-270	R117	D2
97	"	R118	D2
98	"	R119	D3
99	R-76-220	R120	D4
100	"	R121	D2
101	R-76-10K	R122	D2
102	R-76-10M	R123	D3
103	R-76-4.7K	R124	E3
104	"	R125	E3
105	R-76-22	R126	E4
106	R-76-1.5K	R127	E3
107	R-76-1K	R128	E3
108	R-76-10K	R129	E5
109	R-34-1K	R130	E5
110	TF-99	R131	F5
111	R-76-1M	R132	G1
112	R-76-4.7K	R133	E5
113	R-76-3.3K	R134	B2
114	R-76-470	R135	D2
115	"	R136	D2
116	"	R137	D3
117	"	R138	D3
118	"	R139	D3
119	SW-426	S101	A1
120	SW-425	S102	G2
121	SW-377	S103	G5

ITEM	PART NO.	SCHEM. DESIG.	ZONE
122	R-76-3.3K	R140	E5
123			
124	TR-179 OR TR-188	T101	G2
125	TR-188	T101	G2
126			
127	IC-190	U101	B2
128	PRO-106	U102	B2
129			
130	IC-250	U104	B3
131	IC-213	U105	C2
132	IC-163	U106	C2
132	IC-116	U107	C2
133	LS1-6	U108	C2
134	LS1-18	U109	C3
135	LS1-28	U110	C3
136			
137			
138			
139			
140			
141	IC-242	U116	B4
142	IC-247	U117	B4
143	IC-248	U118	C4
144	IC-246	U119	C4
145	IC-251	U120	E2
146	"	U121	E2
147	IC-144	U122	D2
148	IC-213	U123	E2
149	IC-169	U124	E2
150	IC-212	U125	D3
151	IC-163	U126	E3
152	IC-215	U127	E3
153	32468-1	U128	E2
154	32468-2	U129	E3
155	32468-3	U130	F3
156	LS1-14	U131	E5
157	IC-161	U132	E5
158	IC-229	U133	F5
159	"	U134	F5
160	IC-223	U135	F4
161	IC-170	U136	F4
162	IC-253	U137	F4
163			
164			
165			
166			
167			
168			
169			
170	RF-41	CR101	E4
171	DZ-58	VR102	C5
172			
173			
174			
175			
176			
177	J-3	W104	B3
178	J-3	W105	B2
179	J-3	——	E4
180			

ITEM	PART NO.	SCHEM. DESIG.	ZONE
181			
182			
183	CR-10	Y101	C2
184	CR-13	Y102	D4
185			
186			
187			
195	IC-292	AT101	D2
196	"	AT102	D2
197	"	AT103	D3
198	"	AT104	D3
199	"	AT105	D3
208			
209			
210			
211			
212	50-84-40	—	C3
213	50-65	J1008	F4
214		——	
215	50-68	——	C2
216			
217			
218			
219			
220			
221			
222	50-86	—	G5
223	NOT USED		
224	04-29	L102	G6
225	SC-72-2	—	H5
226	SC-72-0	—	H5
227	LU-88	2 REQ'D	H5
228	6-32 X 1/2 PH. PAN HD.	2 REQ'D	A5/F6
229	6-32 HEX NUT	2 REQ'D	A5/F6
230	CC-38-2	2 REQ'D	G6

* NOTE:

△ FOR 100V JAPANESE VERSION, SUBSTITUTE ITEM # 125 (TR-188) FOR ITEM # 124 (TR-179).

ZONE	LTR	ECO NO.	REVISION	DATE
	A	6154	RELEASED	1-24-80
	B	6801	ITEM #13 WAS C-22-.01μF. ITEM #41 WAS C-201-2. ITEM #30 WAS R-176-181-2K ITEM #31 WAS R-176-35.4K ITEM #33 WAS R-176-402.6K ADDED ITEMS 225,226,227.	2-22-80
	C	6830	ADDED ITEMS 112,177 ITEMS 85 & 86 WERE RP-104 REMOVED ITEMS 81,178,223 ITEM 41 WAS C-201-1. ITEM 106 WAS R-76-680	3/8/80
	D	6887	ITEM 34-100 WERE R-76-220 ITEM 119 WAS SW-820 " 120 " SW-357 ADDED ITEMS 42, 113. VR102,103,104 WERE CR81, 102,103 RESPECTIVELY. AT101-105 WERE U111-115 RESPECTIVELY. DELETED ITEM 176.	4-11-80
	E	7026	REMOVED ITEMS 94,172,173,174; ITEM 63 WAS CS-261; ITEMS 195-199 WERE 32-222; ADDED ITEMS 76,77,114-118,228,229 ITEMS 84-88 WERE R-76-150 ITEMS 95-108 WERE R-76-120 ITEM 170 WAS UNIST. RE-LOCATED ITEM 113	6-24-80
G2	F	7430	ADDED TR-188 (T101) ITEM 125 ②	12-1-80
	G	7501	CHG'D THE FOLLOWING ITEMS: #24 FROM C-318-6.8 TO C-314-6.8 #27 " C-240-1500 " C-314-1500 #28 " C-240-1500 " C-314-1500 #29 " C-240-1200 " C-314-1500 #30 " C-318-6.8 " C-314-6.8 #31 " C-318-6.8 " C-314-6.8 #35 " C-318-6.8 " C-314-6.8 #36 " C-318-6.8 " C-314-6.8 ADDED NOTE ITEM # 178. ③	1-5-81
	H	7481	DELETED ITEM 62, 30575A ADDED ITEM 213, 50-65 (J1008)	1-16-81
	J	7460	DELETED ITEM 34, C-22-02 (C131). ADDED ITEM 45, C-324-470pF (C139). ADDED ITEM 46, C-324-680pF (C140). ADDED ITEM 179, J-3 REMOVED ITEMS 216 THRU 218; (50-68). REMOVED ITEMS 219 THRU 221; (50-84-40). ④	2-27-81
	K	9357	DELETED ITEM 5, C-238-1 (C101) ADDED ITEM 122, R-76-3.3K (R140) DELETED ITEM 214, 50-68 DELETED ITEM 129 (J103) CHG'D ART FROM REV. D TO E	10/1/83
	L	9612	SEE PG 1 OF 2	2-20-84
	M	9755	ADDED 50-84-40	3-17-84
	N	10308	SEE PAGE 1	11-2-84
	P	10492	CHG'D ITEM 75 FROM TG-127 TO 32469-1, CHG'D ITEM 153 FROM IC-193 TO 32468-1 ITEM 154 FROM IC-194 TO 32468-2 & ITEM NO. 155 FROM IC-195 TO 32468-3, DELETED ITEMS 208 HS-25, 209 HS-21 210-HS-21 & 211 HS-21.	2-28-85
	R	10545	SEE PAGE 1. ⑤	4-8-85

ITEM	MODEL	NEXT ASSEMBLY	QTY
181			1

USED ON

DO NOT SCALE THIS DRAWING

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED: XX = ± .015 ANG. = ±1° XXX = ± .005 FRAC. = ±1/64 SURFACE MAX. 63

DATE 1/17/80 SCALE 2-1 DRN. MKB ENG. APPR. TFH MATERIAL FINISH

TITLE COMPONENT LAYOUT PC-531 (DIGITAL BOARD)

NO. 30576D Pg 2 of 3

KEITHLEY Keithley Instruments Inc. Cleveland, Ohio 44139

FORM 28511D